How to succeed in business - Zoology in the private sector

Martin Predavec

Parsons Brinckerhoff, GPO Box 5394, Sydney NSW 2000

Email: mpredavec@pb.com.au

Introduction

My three and a half year old nephew wants to work with animals when he grows up – he wants to be a zoo keeper and look after the giraffes. While lots of children have a desire to work with animals, I've yet to come across one wanting to be a consultant, working as a zoologist in the private sector. More surprisingly, I've not come across many university students studying zoology who want to work in the private sector, or who are even aware that such careers exist. So what do zoologists do in the private sector, what skills do you need to succeed as one, how do you become one and what are the good and bad points of such a career?

In this paper I present a limited view of zoology in the private sector: That of an ecological consultant. It is based on my experience working initially for a specialist natural history consultancy and then for a global infrastructure delivery company; and on my experience carrying out ecological consultancies and leading a group of ecologists who carry out such work. In this paper I'll use the term ecologist, but my background is in zoology.

What does an ecological consultant do?

While many jobs for zoologists are relatively easy to define, defining the role of an ecological consultant is much harder. Working for a range of clients ranging from private individuals to developers and including government agencies, services provided by the ecological consultant can be wide and varied, including ecological surveys, habitat mapping, environmental design guidelines, environmental management plans, species management plans and conservation significance assessments. The majority of the work, however, is related to interpreting environmental legislation for clients and determining the significance of potential impacts of developments and other actions on threatened biodiversity. That in itself sounds relatively easy, until you read the legislation (see Text Box 1) and understand the level of information required to complete such assessments. For each project, decisions need to be made on which legislation is relevant, the species likely to be present, the nature of likely impacts, the significance of impacts, and suitable mitigation measures (see examples in Text Boxes 2 and 3). For a large project located in an area with habitat for upwards of thirty threatened species of animal, this can be a major task.

Generally, the types of work that a zoologist will complete as a consultant includes:

- Fauna survey
- Habitat assessment
- Impact significance assessments
- Species Impact Statements
- Referrals under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999*
- Conservation significance assessment
- Threatened species management plans
- Pest management plans
- Biological studies and monitoring
- Experimental design and biological statistical analysis
- Expert review
- Expert evidence.

Some consultants are specialists who restrict their advice primarily to a particular group of animals or possibly a particular geographic region. Such people often work independently and can be in high demand for their specialist knowledge. However as with most fields, there can be only so many specialists. The majority of zoologists in the private sector are generalists, who provide advice on all groups of animals.

The good the bad and the ugly

Like all jobs, being an ecological consultant can have good points and bad. The list below is based on my experiences.

Variety – As a consultant you get to work on a lot of different projects, in a lot of different habitats. I've completed projects throughout Australia as well as overseas in habitats as diverse as rainforests, arid regions and coastal wetlands. I've worked with many species and communities that are considered threatened and have had the opportunity to visit areas of habitat rarely seen, such as those managed by the Sydney Catchment Authority or by the Department of Defence. I've worked on projects as diverse as assessing the likely impacts of proposed wind farms on birds, determining conservation sensitivities for fauna in the Brigalow Belt South bioregion and mapping Koala habitat.

Public perception –There is often the perception that ecological consultants are employed as the advocate of developers. This criticism comes from both ends of the spectrum, with some proponents expecting advocacy for their cause as part of the service and some consent authorities assuming that consultants act as advocates because their conclusions may suggest little or no impact.

The wider public, as concerned observers, and generally not part of the assessment process, often take this view. It is a perception that the industry strongly fights and it is changing. The Ecological Consultants Association of NSW has a code of ethics for practicing members that includes that "Ecological Consultants must exercise their forensic judgements and give their advice independently and for the proper assessment of ecological, conservation and environmental matters, notwithstanding any contrary desires of their clients."

Depth of work – Consultants tend to work on a project for a short period of time and only rarely do we get to go back year after year to the same site and see things change on a seasonal basis. This is in contrast to research positions, in which, if the funding works out, the researcher can return to the same site year after year and gain new insights. Having said that, a consultant will often see the same type of impact repeated in different projects (e.g. the barrier effects of roads) and as a result can gain new insights into appropriate mitigation measures.

Finding solutions – As an ecological consultant you have the opportunity to directly influence projects and their environmental outcomes and thereby contribute to the overall conservation of species and habitats. Its not just a matter of saying "don't do it" – ecological consultants work with engineers, planners and other environmental specialists to find solutions to problems that may arise.

Mix of fieldwork and office – Most zoologists love their time in the field, but don't necessarily want to work in the field all the time. As an ecological consultant there is generally a good mix of field and office-based work. The team of ecologists that I work with would spend on average thirty per cent of their time in the field. As with most jobs, the level of fieldwork tends to be higher for emerging professionals and reduces at the more senior levels as individuals take on other roles such as people management.

Opportunities to learn new skills – A consultant must be good at multitasking and the role will provide training in a range of new skills such as project management, people management, business development/marketing, sales and administration.

Money – Money isn't everything and people don't complete a zoology degree because they want to earn a lot. However an ecological consultant can earn a reasonable salary.

Time – We charge clients by the hour and in doing so a value is placed on our time. However, on the flip side, because we are working to a budget, there are usually tight timeframes on a project. We often would like more time to investigate and look at an issue in depth (see above), but the project timeframes and budgets don't allow.

What skills do you need?

So you like the idea of being a consultant and want to apply for a job? Listed below are the five key skills that I believe are important.

Good technical skills: Ultimately it is our technical skills and reputation that we sell to clients. In the case of a zoologist this consists of a broad and thorough understanding of how animals interact with their environment.

Excellent written and verbal communication skills: Ecology is often seen as the 'naysayer' for a project, and it is important that we can effectively communicate to clients the importance of the natural environment, why elements of the environment must be protected, and what this means for their project. Good writing skills are probably the more important – we provide written reports for our clients. To give you an idea, on average a zoologist in my team contributes to over 60 written reports in one year. Many of these reports will go on public exhibition and need to be written in a way that is easily understood by people with a non-technical background.

A thorough understanding of environmental legislation and in particular threatened species legislation: Ecological work is very much driven by legislation, policies and guidelines, and it is important that the consultant can quickly assess and communicate the impacts of these on a client's project. Within Australia biodiversity is protected under a number of different pieces of legislation and policies at both the state and federal levels, not all of which will apply to all projects.

Sound environmental ethics: An ecological consultant needs to have strong opinions of what is correct environmentally. This needs to be balanced with realism that as a society we want infrastructure and development, whether that is roads, buildings or the like, and that developers can and will act within the current environmental laws.

Good organizational skills: A consultant will often work on multiple projects at one time, all with competing demands. The ability to manage your own time and priorities are vital.

Within New South Wales, the Department of Environment and Conservation is establishing an accreditation scheme for ecological consultants preparing Species Impact Statements. A Species Impact Statement is a detailed assessment of the impacts of a proposal if it is considered likely that it will have a significant impact on threatened species, populations or communities. A Species Impact Statement is a requirement under the NSW *Threatened Species Conservation Act 1995* and the NSW *Environmental Planning and Assessment Act 1979*. Under the proposed scheme it will be necessary to have the following prerequisites for accreditation, which have relevance to the skills needs to be a consultant:

- a Science (or related) degree majoring in biology, zoology, botany, natural resources or environmental science (or related subjects)
- at least 5 years experience in threatened species impact assessment (or at least 10 years relevant experience if you do not possess a relevant degree), with at least 3 years experience in Australia
- at least 2 years experience managing projects of relevance to threatened species and biodiversity assessment
- comprehensive knowledge and understanding of state environmental legislation and planning system
- knowledge and understanding of state and Commonwealth government policies relevant to natural resource management, biodiversity conservation and sustainable development
- a thorough understanding of the principles of, and

methods for, conducting threatened species and biodiversity assessments

- demonstrated up-to-date knowledge of relevant developments in the scientific, technical, regulatory and legal fields relevant to the preparation of Species Impact Statements.

How do you get a job as a consultant?

There is no set way to become an ecological consultant. Some, like me, come from an academic background and transfer the relevant skills across. Other people start their careers as a consultant and develop the skills in the job. In general, however, jobs as ecological consultants are like most others jobs. Some positions are advertised (see further resources), particularly those in the larger consulting companies. Many jobs in zoology are not advertised and it is only through networks that these jobs will become available. If you can build a relationship with these companies, you can have a real advantage in applying for jobs as they become available. Some suggestions for finding that ecological consultants job include:

- Look at job ads – larger companies generally advertise and the demand for ecologists is growing. This will also give you an idea of the types of jobs generally available.
- Send your CV to an environmental recruiter or direct to the company. The Ecological Consultants Association of NSW maintains a list of members on its website and this would be a good starting point to find ecological consultants.
- Volunteer outside of university – experience is everything, but it can be hard to get. The more technical experience you can get the better your CV will look. It may also present job opportunities.
- Do your research on the company in order to understand the types of projects they work on, their ethics and their reputation. Is it a company you would feel comfortable working for?
- Talk to the company directly – many larger consulting companies have graduate programs and are more than happy to discuss opportunities with you.

The future

Like any field of science, zoology is a changing profession and zoology in the private sector is no exception. In the future we are likely to see a number of changes in the way in which ecological consultants work, including:

- increased reliance on technology such as remote detection of animals
- more focus on the design of survey method and consistency. In NSW, the Department of Environment and Climate Change has for the last few years been developing survey guidelines. Other states have similar guidelines and these will give consultants greater strength in arguing the need for detailed survey with clients.
- accreditation of ecologists
- integration of ecological studies into the planning and design process. Rather than being an afterthought in the process, ecologists will more and more have a seat at the table at the initial stages or a project
- more emphasis placed on valuing the environment (e.g. Biobanking) and the use of land brokers
- recognising ecosystem services rather than simply species and habitats.

My view

So is it worth it? Do I enjoy my job? At the end of the day I do enjoy the work that I do. I get the chance to work in some spectacular areas and with an interesting range of species; I work on some very interesting projects; and I believe I can make a difference. At times I would like more thinking time, time to mull over issues and to come up with more innovative solutions without having to fill in a timesheet, but on balance that is a small price to pay. I've now had a number of different jobs in zoology including being a PhD student, completing postdoctoral studies, lecturing and being a researcher. I've loved all of them and so far have had a great career. Being an ecological consultant is challenging – it can be fast-paced, demanding, and with a fair amount of pressure. It is not the job for everyone. But if you're finishing your degree and want a career that involves animals, variety, the ability to make a difference and a good work-life balance then I would urge you to consider roles in the private sector.

Other resources

- Ecological Consultants Association of NSW (http://www.ecansw.org.au/) – includes a list of practicing members
- NSW Department of Planning (http://www.planning.nsw.gov.au/asp/onexhibition.asp) – some examples of the types of reports that consultants prepare.
- NSW Legislation website (http://www.legislation.nsw.gov.au/) – includes the full text of relevant legislation including the Threatened Species Conservation Act 1995, National Parks and Wildlife Act 1974, Native Vegetation Act 2003, Environmental Planning and Assessment Act 1979.
- Department of the Environment, Water, Heritage and the Arts *Environment Protection and Biodiversity Conservation Act 1999* (http://www.deh.gov.au/epbc/index.html).
- Enviro Jobs (http://www.envirojobs.com.au/) – try searching for ecologists rather than simply zoologists
- NRMJobs (http://www.nrmjobs.com.au/) – try searching for ecologists rather than simply zoologists.

Acknowledgements

The opportunity to present and write this paper was provided by Adam Munn of the Royal Zoological Society. Most of the work that I've completed as a zoologist at PB has been in association with a fantastic group of ecologists including Selga Harrington, Peter Monsted and Alex Fraser. Thanks also to Gloucester Shire Council (Glenn Wilcox) and the Department of Primary Industries (Ken Hollands) for allowing me to outline their projects.

APPENDIX 1

Martin Predavec is a principal ecologist with the global consulting company Parsons Brinckerhoff. He leads a team of ecologists, including zoologists, who undertake ecological studies and assessment of a variety of infrastructure projects. Martin completed his BSc and PhD at The University of Sydney before undertaking postdoctoral studies in northern Canada, and then teaching at Monash University. Martin has over 18 years experience in terrestrial and wildlife ecology in Australia, Europe, Asia and North America. Martin's work concerns natural resource management, identification of key resources in conservation and preparation of management plans. One of his particular areas of skill is the application of Federal and State environmental legislation, including the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the NSW *Environmental Planning and Assessment Act 1979*.

Text box 1: The test of significance

In order to assess the impact of a project on threatened biodiversity under the NSW Environmental Planning and Assessment Act 1979 you need to address the following points:

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

  (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

  (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

(d) in relation to the habitat of a threatened species, population or ecological community:

  (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

  (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

  (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

APPENDIX 1

Text box 2

Example project 1: Gloucester Grey-crowned Babbler Retention Plan

The Grey-crowned Babbler is a distinctive medium sized bird measuring approximately 29 centimetres in length, which is listed as Vulnerable under the New South Wales *Threatened Species Conservation Act 1995*, meaning it is facing a high risk of extinction in New South Wales in the medium-term.

Grey-crowned Babblers have declined considerably within the Hunter region, with most now centred on the Lower Hunter Valley and Gloucester areas. Approximately 12 family groups are known to be distributed throughout Gloucester Shire Council boundaries from Gloucester township to Monkerai and both sides of the Bucketts Way.

Two family groups of Grey-crowned Babbler are known to currently occur in the southern half of Gloucester township, forming the northerly extent of known family groups within the Gloucester Shire council boundaries.

Gloucester Shire Council recognised that with the increased population growth and demand for land on the boundaries and outskirts of the Gloucester Township, the need to address current and future issues in relation to the habitat of the species is of upmost importance and commissioned Parsons Brinckerhoff to prepare a species retention plan.

The plan included management measures such as:

- protection and restoration of habitat
- management of traffic to reduce collisions
- raising public awareness of the Grey-crowned Babbler
- further research into Grey-crowned Babblers within Gloucester Shire
- further planning controls including control of domestic cats
- monitoring numbers and distribution within Gloucester.

Council is now in the process of implementing the plan.

In order to complete and win this work we had to go through a process that included:

- preparing a proposal for the work that included a detailed methodology and fixed budget
- meeting with Council to determine their needs and expectations for the project
- consulting with stakeholders within Gloucester including the National Parks and Wildlife Service and conservation groups
- completing field survey of habitats for this species within the township of Gloucester
- undertaking a literature review of information relating to the species, including accessing where possible unpublished studies
- preparing a draft retention plan including identifying areas for habitat retention/enhancement and management measures. The plan had to be written in a manner suitable for public exhibition and including clear figures and maps
- preparing a brochure on the species and the plan suitable for distribution to local residents.

APPENDIX 1

Text box 3

Example project 2: Lightning Ridge Biodiversity Surveys

Opal has been mined at Lightning Ridge, located in central northern New South Wales, since the early 1900s. Opal mining is presently carried out in three defined Opal Prospecting Areas located within the Narran-Warrambool Reserve which comprises approximately 5,000 square kilometres and incorporates the Lightning Ridge township.

The opening of a new opal prospecting area (OPA 4), covering 1,606 square kilometres, was proposed and the Department of Primary Industries commissioned PB to complete a Review of Environmental Factors to determine the likely impacts of mining in this new area. This document suggested that mining in this area may have a negative affect on biodiversity and in particular threatened biodiversity as listed under the *Threatened Species Conservation Act 1995* and the *Environment Protection and Biodiversity Conservation Act 1999*. A recommendation was made that more detailed biodiversity surveys be undertaken in areas considered likely to contain significant ecological areas prior to the release of opal prospecting blocks.

Parsons Brinckerhoff was commissioned by the Department to carry out biodiversity surveys of two properties, Barfield and Kurrajong, proposed for opal mining activities. This assessment included a combination of database and literature reviews as well as a general field survey.

Given that the location and degree of impacts are difficult to determine prior to opal mining starting (see Photograph 1), the assessment looked primarily at the current extent and condition of biodiversity within the two properties. A determination as to their sensitivity and significance was made so as to avoid significant impacts.

The site contained seven vegetation communities including a regionally significant Spinifex community (Photograph 2). Also recorded on site were the Yellow-bellied Sheathtail Bat, Inland Forest Bat and the Grey-crowned Babbler, all of which are listed as threatened under the *Threatened Species Conservation Act 1995*.

Impact assessments were completed for threatened species occurring or likely to occur within the site and concluded that a moderate level of mining activity was unlikely to have a significant impact on threatened biodiversity. Impacts would be avoided or minimised through the provision of ameliorative measures. A number of mitigation measures were recommended in order to minimise impacts to biodiversity including avoiding sensitive and significant areas such as box swamps and areas containing Spinifex.

The key challenge for Parsons Brinckerhoff in this project was determining potential impacts of mining across such a large area and recommending realistic mitigation measures that would account for the uncertainty as to where mining may occur and its intensity.

APPENDIX 2

Localised impacts of underground mining at the mineral claim scale

Regionally significant Spinifex community with over storey of Poplar Box and Silver-leaf Ironbark